

APPENDIX C - ATTACHMENT B

# Mitigation Cost Estimates

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**Bunker Hill**  
**AMD Mitigation Concepts**  
**2.1: West Fork Diversion**  
**Order of Magnitude Cost Opinion**

**DATE: 06/13/2000**  
**PROJECT NO.: 152215.FS.02**  
**ESTIMATE BY: D. Hedglin**  
**T. Pyle**

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST	COMMENTS
<b>Site Access Road</b>					
Clear & Grub New Road	3,500	LF	8.62	\$30,153	asm 30'w & 50'/hour
Grade, Fill & Compact New Road	3,500	LF	76.32	\$267,137	encounter rock
Base Course on New Road	1,296	CY	24.92	\$32,307	
Grade & Improve Existing Road	400	LF	28.90	\$11,559	
Erosion & Sedimentation Control	1	LS	47,054.48	\$47,054	\$/LF allowance for ditches, culverts, silt fences, sed ponds, etc
<b>Diversion Structure</b>					
Diversion/Care of Water	1	LS	10,000.00	\$10,000	
Excavate for Sheetpile Dam	1,800	CY	17.23	\$31,014	
Native Backfill Around Sheetpiles	1,800	CY	13.30	\$23,940	
Sheetpile Wall for Cutoff	2,250	SF	30.00	\$67,500	
Excavate for Screen Structure	70	CY	17.23	\$1,206	
Native Backfill Around Screen Structure	20	CY	13.30	\$266	
Backfill Riprap Overflow Spillway	325	CY	39.95	\$12,984	
Construct Screen Intake Structure	15	CY	552.24	\$8,284	
Construct Transition Structure	15	CY	552.24	\$8,284	
Foundation Grout Curtain	1,500	LF	40.00	\$60,000	Includes diamond drilling, grout pipe, pressure testing, etc.
Bar Screen	1	LS	10,329.99	\$10,330	
<b>Collector Pipe &amp; Gabions</b>					
Excavation	300	CY	17.23	\$5,169	
Imported Bed, Zone & Backfill	250	CY	31.62	\$7,906	
Waste	300	CY	3.29	\$986	
36" Perf. Collector Pipe	200	LF	68.62	\$13,724	
Regrade Stream	1	LS	20,676.10	\$20,676	
Gabion Sediment Traps	50	CY	183.25	\$9,162	
<b>Pipeline &amp; Access Road</b>					
36" Pipeline in Imp Road	750	LF	127.24	\$95,430	including earthwork & fittings
30" Pipeline in New Road	750	LF	117.24	\$87,928	including earthwork & fittings
36" Pipeline in Unimp Road	1,700	LF	241.71	\$410,912	including earthwork & fittings
36" Overland Pipe	150	LF	214.48	\$32,171	including earthwork, supports & fittings
42" Slip Pipe for Overland Pipe	40	LF	127.24	\$5,090	including earthwork, supports & fittings
Anchor Block	2	EA	4,061.89	\$8,124	asm 6cy & 5hrs to form, rebar, place
Anchor Fitting	2	EA	1,172.38	\$2,345	allowance
Slip Joint Gasket	1	EA	1,186.19	\$1,186	based on quote for Lake Tapps outfall
Thrust Block	7	EA	822.38	\$5,757	
Air Vent	2	EA	586.19	\$1,172	
Cut-Off Trench Seepage Walls	30	EA	2,100.00	\$63,000	asm 7cy @ \$300/cy
22 1/2 Degree Elbow	10	EA	2,572.38	\$25,724	
<b>Bureau of Reclamation Stilling Basin</b>					
Structure Complete	4	LS	67,230.08	\$268,920	based on Lake Tapps design & estimate
<b>SUBTOTAL</b>				<b>\$1,687,400</b>	
<b>MISC ALLOWANCE</b>	<b>10%</b>			<b>\$168,740</b>	
<b>SUBTOTAL</b>				<b>\$1,856,140</b>	
<b>CONTINGENCY</b>	<b>30%</b>			<b>\$556,842</b>	
<b>SUBTOTAL</b>				<b>\$2,412,983</b>	
<b>MOBILIZATION</b>	<b>15%</b>			<b>\$361,947</b>	
<b>CONSTRUCTION TOTAL</b>				<b>\$2,774,930</b>	
<b>SALES TAX ON MATERIALS</b>	<b>5.0%</b>			<b>\$33,487</b>	
<b>ENGINEERING AND SUPPORT</b>	<b>20%</b>			<b>\$554,986</b>	
<b>CONST MANAGEMENT</b>	<b>8%</b>			<b>\$221,994</b>	
<b>CAPITAL TOTAL (ROUNDED)</b>				<b>\$3,590,000</b>	
<b>ANNUAL O&amp;M COST</b>			<b>\$27,700</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>				<b>\$344,000</b>	
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>				<b>\$3,934,000</b>	

**NOTES:**

Misc Allowance markup is to include items known to exist but cannot be quantified at this time.  
Contingency is for scope changes that are presently unforeseen.  
Mobilization includes bonds, insurance, temporary facilities, health & safety, demobilization, etc.



## O &amp; M COST ESTIMATE DETAILS

Tasks	Qty	Unit	Material Unit Cost	Labor Unit Cost	Equip Unit Cost	Total Cost	Comments
<b><u>Annual Costs</u></b>							
Inspection	1	YR	0	1,600	320	\$1,920	asm 4 times/year & 8hrs/time @ \$50/hr labor & \$10 for pickup
Road Maintenance & Repairs	1	YR	1,000	4,477	2,016	\$7,493	asm 3 time/year & 8hrs/time + material allowance
Pipeline & Structure Maint. & Repairs	1	YR	2,000	7,448	6,336	\$15,784	asm 4 times/year & 8hrs/time + material allowance
						\$25,197	
						\$2,520	
<b>Contingency</b>	10%						
<b>Total Annual Cost</b>						<b>\$27,717</b>	

Bunker Hill  
 AMD Mitigation Concepts  
 2.2.1: Rehabilitate Phil Sheridan Diversion  
 Order of Magnitude Cost Opinion

DATE: 06/13/2000  
 PROJECT NO.: 152215.FS.02  
 ESTIMATE BY: D. Hedglin  
 T. Pyle

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST	COMMENTS
<b>Open Phil Sheridan Raises</b>					
<b>Site Access Road</b>					
Grade & Improve Existing Road	200	LF	28.90	\$5,779	
Erosion & Sedimentation Control	1	LS	5,328.72	\$5,329	\$/LF allowance for ditches, culverts, silt fences, sed ponds, etc
<b>Raise #1</b>					
Open Up Raise #1	100	CY	107.69	\$10,769	
Sink 6' Casing from Surface to Rock Line	25	LF	228.92	\$5,723	
Prefabricated Steel Inlet Structure	1	LS	10,000.00	\$10,000	
Native Backfill Around Screen Structure	100	CY	17.23	\$1,723	
Place Riprap	100	CY	26.65	\$2,665	
<b>Raise #2</b>					
Open Up Raise #2	100	CY	107.69	\$10,769	
Sink 10' Casing from Surface to Rock Line	25	CY	2,500.00	\$62,500	
Native Backfill Around Screen Structure	100	CY	17.23	\$1,723	
Construct Screen Intake Structure	20	CY	500.90	\$10,018	
Screens for Inlet Structure	2	LS	10,659.98	\$21,320	
Regrade Stream	1	LS	10,338.05	\$10,338	
Place Riprap	100	CY	26.65	\$2,665	
<b>Drift Construction</b>					
<b>Site Access Road</b>					
Clear & Grub New Road for Access	150	LF	8.62	\$1,292	
Grade, Fill & Compact New Road	150	LF	76.32	\$11,449	\$/LF allowance for ditches, culverts, silt fences, sed ponds, etc
Base Course on New Road	56	CY	24.92	\$1,385	
Erosion & Sedimentation Control	1	LS	7,410.90	\$7,411	
<b>Proposed Drift Construction</b>					
Drift Advancement	300	LF	500.00	\$150,000	Based on costs provided by Bill Hudson
Access Road and Staging Area	1	LS	15,000.00	\$15,000	Based on costs provided by Bill Hudson
Diversion/Care of Water	1	LS	20,000.00	\$20,000	
Bulkhead/Bracing for new portal area	1	LS	25,000.00	\$25,000	
Concrete Collar with Steel Bulkhead Dam	8	CY	566.25	\$4,530	
<b>HDPE Diversion Pipeline</b>					
42" HDPE Pipeline in adit	300	LF	264.48	\$79,343	including supports & fittings
36" HDPE buried in Unimp Road	100	LF	241.71	\$24,171	including earthwork & fittings
Anchor Block	2	EA	4,061.89	\$8,124	asm 6cy & 5hrs to form, rebar, place
Cut-Off Trench Seepage Walls	1	EA	2,100.00	\$2,100	asm 7cy @ \$500/cy
Concentric Reducer 42" by 36"	1	EA	2,572.38	\$2,572	
<b>SUBTOTAL</b>				<b>\$513,697</b>	
<b>MISC ALLOWANCE</b>	<b>10%</b>			<b>\$51,370</b>	
<b>SUBTOTAL</b>				<b>\$565,067</b>	
<b>CONTINGENCY</b>	<b>50%</b>			<b>\$282,534</b>	
<b>SUBTOTAL</b>				<b>\$847,601</b>	
<b>MOBILIZATION</b>	<b>15%</b>			<b>\$127,140</b>	
<b>CONSTRUCTION TOTAL</b>				<b>\$974,741</b>	
<b>SALES TAX ON MATERIALS</b>	<b>5.0%</b>			<b>\$1,710</b>	
<b>ENGINEERING AND SUPPORT</b>	<b>20%</b>			<b>\$194,948</b>	
<b>CONST MANAGEMENT</b>	<b>8%</b>			<b>\$77,979</b>	
<b>CAPITAL TOTAL (ROUNDED)</b>				<b>\$1,250,000</b>	
<b>ANNUAL O&amp;M COST</b>			<b>\$18,200</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>				<b>\$226,000</b>	
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>				<b>\$1,476,000</b>	

## NOTES:

Misc Allowance markup is to include items known to exist but cannot be quantified at this time.  
 Contingency is for scope changes that are presently unforeseen.  
 Mobilization includes bonds, insurance, temporary facilities, health & safety, demobilization, etc.



O & M COST ESTIMATE DETAILS

Tasks	Qty	Unit	Material Unit Cost	Labor Unit Cost	Equip Unit Cost	Total Cost	Comments
<b>Annual Costs</b>							
Inspection	1	YR	0	1,800	240	\$2,040	asm 3 times/year & 8hrs/time @ \$50/hr labor & \$10 for pickup
Road Maintenance & Repairs	1	YR	1,000	1,492	672	\$3,164	asm 1 time/year & 8hrs/time + material allowance
Pipeline & Structure Maint. & Repairs	1	YR	1,000	5,586	4,752	\$11,338	asm 3 times/year & 8hrs/time + material allowance
						\$16,542	
<b>Contingency</b>	10%					\$1,654	
<b>Total Annual Cost</b>						<b>\$18,197</b>	

Bunker Hill  
 AMD Mitigation Concepts  
 2.2.2: Improve Phil Sheridan Diversion Rehabilitation  
 Order of Magnitude Cost Opinion

DATE: 06/13/2000  
 PROJECT NO.: 152215.FS.02  
 ESTIMATE BY: D. Hedglin  
 T. Pyle

DESCRIPTION	QTY	TOTAL UNIT COST	TOTAL COST	COMMENTS
Foundation Grout Curtain	1,500	40.00	\$60,000	
Sheetpile Wall for Cutoff	3,000	30.00	\$90,000	
Dig/Drill/Install Collection Drains for Groundwater	50	120.00	\$6,000	
<b>SUBTOTAL</b>			<b>\$156,000</b>	
<b>MISC ALLOWANCE</b>	<b>10%</b>		<b>\$15,600</b>	
<b>SUBTOTAL</b>			<b>\$171,600</b>	
<b>CONTINGENCY</b>	<b>50%</b>		<b>\$85,800</b>	
<b>SUBTOTAL</b>			<b>\$257,400</b>	
<b>MOBILIZATION</b>	<b>15%</b>		<b>\$38,610</b>	
<b>CONSTRUCTION TOTAL</b>			<b>\$296,010</b>	
<b>SALES TAX ON MATERIALS</b>	<b>5.0%</b>		<b>\$1,925</b>	
<b>ENGINEERING AND SUPPORT</b>	<b>20%</b>		<b>\$59,202</b>	
<b>CONST MANAGEMENT</b>	<b>8%</b>		<b>\$23,681</b>	
<b>CAPITAL TOTAL (ROUNDED)</b>			<b>\$380,000</b>	
<b>ANNUAL O&amp;M COST</b>		<b>\$500</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>			<b>\$6,000</b>	
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>			<b>\$386,000</b>	

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# O & M COST ESTIMATE DETAILS

Tasks	Qty	Unit	Material Unit Cost	Labor Unit Cost	Equip Unit Cost	Total Cost	Comments
<b>Annual Costs</b>							
Inspection	1	YR	0	400	80	\$480	asm 1 times/year & 8hrs/time @ \$50/hr labor & \$10 for pickup
Road Maintenance & Repairs	1	YR	0	0	0	\$0	
Pipeline & Structure Maint. & Repairs	1	YR	0	0	0	\$0	
						\$480	
<b>Contingency</b>	10%					\$48	
<b>Total Annual Cost</b>						<b>\$528</b>	



Bunker Hill  
 AMD Mitigation Concepts  
 2.3: Sidehill Diversion above Guy Cave  
 Order of Magnitude Cost Opinion

DATE: 06/13/2000  
 PROJECT NO.: 152215.FS.02  
 ESTIMATE BY: D. Hedglin

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST	COMMENTS
<b>Access Roads</b>					
Clear & Grub	940	LF	8.62	\$8,098	asm 30'w & 50'/hour
Grade, Fill & Compact	940	LF	76.32	\$71,745	60% rock
Crushed Surfacing Base Course	348	CY	21.65	\$7,537	
Erosion matting & mulch on all disturbed cut slopes	47,000	SF	1.00	\$47,000	jute mat & hydroseed-allow
Ditch Lining System	940	LF	47.90	\$45,024	
Construct Screen Intake Structure	20	CY	500.90	\$10,018	
Erosion & Sedimentation Control	1	LS	9,400.00	\$9,400	\$/LF allowance for ditches, culverts, silt fences, sed ponds, etc
<b>SUBTOTAL</b>				<b>\$198,823</b>	
<b>MISC ALLOWANCE</b>	<b>10%</b>			<b>\$19,882</b>	
<b>SUBTOTAL</b>				<b>\$218,705</b>	
<b>CONTINGENCY</b>	<b>50%</b>			<b>\$109,352</b>	
<b>SUBTOTAL</b>				<b>\$328,057</b>	
<b>MOBILIZATION</b>	<b>15%</b>			<b>\$49,209</b>	
<b>CONSTRUCTION TOTAL</b>				<b>\$377,266</b>	
<b>SALES TAX ON MATERIALS</b>	<b>5.0%</b>			<b>\$2,306</b>	
<b>ENGINEERING AND SUPPORT</b>	<b>20%</b>			<b>\$75,453</b>	
<b>CONST MANAGEMENT</b>	<b>8%</b>			<b>\$30,181</b>	
<b>CAPITAL TOTAL (ROUNDED)</b>				<b>\$490,000</b>	
<b>ANNUAL O&amp;M COST</b>			<b>\$11,700</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>				<b>\$145,000</b>	
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>				<b>\$635,000</b>	

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Sidehill O&M

O & M COST ESTIMATE DETAILS

Tasks	Qty	Unit	Material Unit Cost	Labor Unit Cost	Equip Unit Cost	Total Cost	Comments
<b>Annual Costs</b>							
Inspection	1	YR	0	400	80	\$480	asm 1 time/year & 8hrs/time @ \$50/hr labor & \$10 for pickup
Road Maintenance & Repairs	1	YR	500	4,477	2,016	\$6,993	asm 13time/year & 8hrs/time + material allowance
Pipeline & Structure Maint. & Repairs	1	YR	0	0	3,168	\$3,168	asm 1 times/year & 8hrs/time + material allowance
						\$10,641	
<b>Contingency</b>	10%					\$1,064	
<b>Total Annual Cost</b>						<b>\$11,705</b>	

Bunker Hill  
 AMD Mitigation Concepts  
 3.1: South Fork Diversion  
 Order of Magnitude Cost Opinion

DATE: 06/13/2000  
 PROJECT NO.: 152215.FS.02  
 ESTIMATE BY: D. Hedglin

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST	COMMENTS
<b>Site Access Road</b>					
Clear & Grub New Road	1,330	LF	8.62	\$11,458	asm 30'w & 50'/hour
Grade, Fill & Compact New Road	1,330	LF	38.16	\$50,756	
Base Course on New Road	493	CY	24.92	\$12,277	
Grade & Improve Existing Road	800	LF	28.90	\$23,118	
Erosion & Sedimentation Control	1	LS	41,643.58	\$41,644	\$/LF allowance for ditches, culverts, silt fences, sed ponds, etc
<b>Diversion Structure</b>					
Diversion/Care of Water	1	LS	10,000.00	\$10,000	
Excavate for Sheetpile Dam	900	CY	17.23	\$15,507	
Native Backfill Around Sheetpiles	900	CY	13.30	\$11,970	
Sheetpile Wall for Cutoff	1,100	SF	30.00	\$33,000	
Excavate for Screen Structure	70	CY	17.23	\$1,206	
Native Backfill Around Screen Structure	20	CY	13.30	\$266	
Backfill Riprap Overflow Spillway	325	CY	39.95	\$12,984	
Construct Screen Intake Structure	15	CY	552.24	\$8,284	
Construct Transition Structure	15	CY	552.24	\$8,284	
Foundation Grout Curtain	750	LF	40.00	\$30,000	
Bar Screen	1	LS	10,329.99	\$10,330	
<b>Collector Pipe &amp; Gabions</b>					
Excavation	300	CY	17.23	\$5,169	
Imported Bed, Zone & Backfill	250	CY	31.62	\$7,906	
Waste	300	CY	3.29	\$986	
36" Perf. Collector Pipe	200	LF	68.62	\$13,724	
Regrade Stream	1	LS	20,676.10	\$20,676	
Gabion Sediment Traps	50	CY	183.25	\$9,162	
<b>Pipeline &amp; Access Road</b>					
36" Pipeline in Imp Road	850	LF	127.24	\$108,152	including earthwork & fittings
36" Pipeline in New Road	1,350	LF	127.24	\$171,771	including earthwork & fittings
Stream Crossing	1	EA	4,579.02	\$4,579	
Thrust Block	1	EA	822.38	\$822	
Air Vent	3	EA	586.19	\$1,759	
Cut-Off Trench Seepage Walls	22	EA	2,100.00	\$46,200	asm 7cy @ \$300/cy
Thrust Block	2	EA	3,789.51	\$7,579	
<b>Bureau of Reclamation Stilling Basin</b>					
Structure Complete	2	LS	67,230.08	\$134,460	based on Lake Tapps design & estimate
<b>SUBTOTAL</b>				<b>\$814,028</b>	
<b>MISC ALLOWANCE</b>				<b>\$81,403</b>	
<b>SUBTOTAL</b>				<b>\$895,431</b>	
<b>CONTINGENCY</b>				<b>\$358,173</b>	
<b>SUBTOTAL</b>				<b>\$1,253,604</b>	
<b>MOBILIZATION</b>				<b>\$188,041</b>	
<b>CONSTRUCTION TOTAL</b>				<b>\$1,441,644</b>	
<b>SALES TAX ON MATERIALS</b>				<b>\$20,664</b>	
<b>ENGINEERING AND SUPPORT</b>				<b>\$288,329</b>	
<b>CONST MANAGEMENT</b>				<b>\$115,332</b>	
<b>CAPITAL TOTAL (ROUNDED)</b>				<b>\$1,870,000</b>	
<b>ANNUAL O&amp;M COST</b>			<b>\$29,900</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>				<b>\$371,000</b>	
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>				<b>\$2,241,000</b>	

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## O &amp; M COST ESTIMATE DETAILS

Tasks	Qty	Unit	Material Unit Cost	Labor Unit Cost	Equip Unit Cost	Total Cost	Comments
<b><u>Annual Costs</u></b>							
Inspection	1	YR	0	400	80	\$480	asm 1 time/year & 8hrs/time @ \$50/hr labor & \$10 for pickup
Road Maintenance & Repairs	1	YR	500	4,477	2,016	\$6,993	asm 13time/year & 8hrs/time + material allowance
Pipeline & Structure Maint. & Repairs	1	YR	0	0	3,168	\$3,168	asm 1 times/year & 8hrs/time + material allowance
						\$10,641	
<b>Contingency</b>	10%					\$1,064	
<b>Total Annual Cost</b>						<b>\$11,705</b>	



**Bunker Hill**  
**AMD Mitigation Concepts**  
**3.1: South Fork Diversion**  
**Order of Magnitude Cost Opinion**

**DATE: 06/13/2000**  
**PROJECT NO.: 152215.FS.02**  
**ESTIMATE BY: D. Hedglin**

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST	COMMENTS
<b>Site Access Road</b>					
Clear & Grub New Road	1,330	LF	8.62	\$11,458	asm 30'w & 50'/hour
Grade, Fill & Compact New Road	1,330	LF	38.16	\$50,756	
Base Course on New Road	493	CY	24.92	\$12,277	
Grade & Improve Existing Road	800	LF	28.90	\$23,118	
Erosion & Sedimentation Control	1	LS	41,643.58	\$41,644	\$/LF allowance for ditches, culverts, silt fences, sed ponds, etc
<b>Diversion Structure</b>					
Diversion/Care of Water	1	LS	10,000.00	\$10,000	
Excavate for Sheetpile Dam	900	CY	17.23	\$15,507	
Native Backfill Around Sheetpiles	900	CY	13.30	\$11,970	
Sheetpile Wall for Cutoff	1,100	SF	30.00	\$33,000	
Excavate for Screen Structure	70	CY	17.23	\$1,206	
Native Backfill Around Screen Structure	20	CY	13.30	\$266	
Backfill Riprap Overflow Spillway	325	CY	39.95	\$12,984	
Construct Screen Intake Structure	15	CY	552.24	\$8,284	
Construct Transition Structure	15	CY	552.24	\$8,284	
Foundation Grout Curtain	750	LF	40.00	\$30,000	
Bar Screen	1	LS	10,329.99	\$10,330	
<b>Collector Pipe &amp; Gabions</b>					
Excavation	300	CY	17.23	\$5,169	
Imported Bed, Zone & Backfill	250	CY	31.62	\$7,906	
Waste	300	CY	3.29	\$986	
36" Perf. Collector Pipe	200	LF	68.62	\$13,724	
Regrade Stream	1	LS	20,676.10	\$20,676	
Gabion Sediment Traps	50	CY	183.25	\$9,162	
<b>Pipeline &amp; Access Road</b>					
36" Pipeline in Imp Road	850	LF	127.24	\$108,152	including earthwork & fittings
36" Pipeline in New Road	1,350	LF	127.24	\$171,771	including earthwork & fittings
Stream Crossing	1	EA	4,579.02	\$4,579	
Thrust Block	1	EA	822.38	\$822	
Air Vent	3	EA	586.19	\$1,759	
Cut-Off Trench Seepage Walls	22	EA	2,100.00	\$46,200	asm 7cy @ \$300/cy
Thrust Block	2	EA	3,789.51	\$7,579	
<b>Bureau of Reclamation Stilling Basin</b>					
Structure Complete	2	LS	67,230.08	\$134,460	based on Lake Tapps design & estimate
<b>SUBTOTAL</b>				<b>\$814,028</b>	
<b>MISC ALLOWANCE</b>				<b>\$81,403</b>	
<b>SUBTOTAL</b>				<b>\$895,431</b>	
<b>CONTINGENCY</b>				<b>\$358,173</b>	
<b>SUBTOTAL</b>				<b>\$1,253,604</b>	
<b>MOBILIZATION</b>				<b>\$188,041</b>	
<b>CONSTRUCTION TOTAL</b>				<b>\$1,441,644</b>	
<b>SALES TAX ON MATERIALS</b>				<b>\$20,664</b>	
<b>ENGINEERING AND SUPPORT</b>				<b>\$288,329</b>	
<b>CONST MANAGEMENT</b>				<b>\$115,332</b>	
<b>CAPITAL TOTAL (ROUNDED)</b>				<b>\$1,870,000</b>	
<b>ANNUAL O&amp;M COST</b>			<b>\$29,900</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>				<b>\$371,000</b>	
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>				<b>\$2,241,000</b>	

**NOTES:**

Misc Allowance markup is to include items known to exist but cannot be quantified at this time.

Contingency is for scope changes that are presently unforeseen.

Mobilization includes bonds, insurance, temporary facilities, health & safety, demobilization, etc.



S Fork O&M

O & M COST ESTIMATE DETAILS

Tasks	Qty	Unit	Material Unit Cost	Labor Unit Cost	Equip Unit Cost	Total Cost	Comments
<b><u>Annual Costs</u></b>							
Inspection	1	YR	0	3,200	320	\$3,520	asm 8 times/year & 8hrs/time @ \$50/hr labor & \$10 for pickup
Road Maintenance & Repairs	1	YR	1,000	3,724	3,168	\$7,892	asm 1 time/year & 8hrs/time + material allowance
Pipeline & Structure Maint. & Repairs	1	YR	2,000	7,448	6,336	\$15,784	asm 4 times/year & 8hrs/time + material allowance
						\$27,196	
<b>Contingency</b>	10%					\$2,720	
<b>Total Annual Cost</b>						<b>\$29,916</b>	



Bunker Hill  
 AMD Mitigation Concepts  
 4.1: Plug Small Hopes (SH) Drift  
 Order of Magnitude Cost Opinion

DATE: 06/13/2000  
 PROJECT NO.: 152215.FS.02  
 ESTIMATE BY: D. Hedglin

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST	COMMENTS
<b>Plug Shaft</b>					
Survey to Determine Location of SH Drift	1	LS	1,600.00	\$1,600	
Install New Access Shaft to SH Drift	1	LS	10,000.00	\$10,000	
Clean Out SH Drift & Find 2-Raises to Level 5	1	LS	51,690.24	\$51,690	
Clean Out Min. of 16 Feet of Shafts to 5 Level	1	LS	10,338.05	\$10,338	
Prepare for Plug	2	EA	5,319.96	\$10,640	
Concrete Plug	60	CY	272.30	\$16,338	
Construct Bulkhead Each End of SH Drift	2	EA	3,398.96	\$6,798	400bf each @ 1.50/bf * 8hrs to install
Transport Mix to Pump Site	400	CY	3.29	\$1,315	
Fill all Bulkheaded Areas w/Sand/Cement	400	CY	83.05	\$33,222	add for mixing as in Cherry, etc
Remove/Backfill Access Shaft	1	LS	2,659.98	\$2,660	
Replace Culvert Under Road	1	LS	3,546.02	\$3,546	
<b>SUBTOTAL</b>				<b>\$148,147</b>	
<b>MISC ALLOWANCE</b>	<b>10%</b>			<b>\$14,815</b>	
<b>SUBTOTAL</b>				<b>\$162,962</b>	
<b>CONTINGENCY</b>	<b>50%</b>			<b>\$81,481</b>	
<b>SUBTOTAL</b>				<b>\$244,443</b>	
<b>MOBILIZATION</b>	<b>15%</b>			<b>\$36,666</b>	
<b>CONSTRUCTION TOTAL</b>				<b>\$281,109</b>	
<b>SALES TAX ON MATERIALS</b>	<b>5.0%</b>			<b>\$1,365</b>	
<b>ENGINEERING AND SUPPORT</b>	<b>20%</b>			<b>\$56,222</b>	
<b>CONST MANAGEMENT</b>	<b>8%</b>			<b>\$22,489</b>	
<b>CAPITAL TOTAL (ROUNDED)</b>				<b>\$360,000</b>	
<b>ANNUAL O&amp;M COST</b>			<b>\$500</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>				<b>\$6,000</b>	
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>				<b>\$366,000</b>	

## NOTES:

Misc Allowance markup is to include items known to exist but cannot be quantified at this time.

Contingency is for scope changes that are presently unforeseen.

Mobilization includes bonds, insurance, temporary facilities, health & safety, demobilization, etc.



O & M COST ESTIMATE DETAILS

Tasks	Qty	Unit	Material Unit Cost	Labor Unit Cost	Equip Unit Cost	Total Cost	Comments
<b><u>Annual Costs</u></b>							
Inspection	1	YR	0	400	80	\$480	asm 1 times/year & 8hrs/time @ \$50/hr labor & \$10 for pickup
Road Maintenance & Repairs	1	YR	0	0	0	\$0	
Pipeline & Structure Maint. & Repairs	1	YR	0	0	0	\$0	
						\$480	
<b>Contingency</b>	10%					\$48	
<b>Total Annual Cost</b>						<b>\$528</b>	

Bunker Hill  
 AMD Mitigation Concepts  
 4.2: Bypass Bunker Hill Reservoir  
 Order of Magnitude Cost Opinion

DATE: 06/13/2000  
 PROJECT NO.: 152215.FS.02  
 ESTIMATE BY: D. Hedglin  
 T.Pyle

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST	COMMENTS
Modify Outlet Works	1	LS	15,000.00	\$15,000	
New Pipeline and Connection	1	LS	15,000.00	\$15,000	
<b>SUBTOTAL</b>				<b>\$30,000</b>	
<b>MISC ALLOWANCE</b>	<b>10%</b>			<b>\$3,000</b>	
<b>SUBTOTAL</b>				<b>\$33,000</b>	
<b>CONTINGENCY</b>	<b>30%</b>			<b>\$9,900</b>	
<b>SUBTOTAL</b>				<b>\$42,900</b>	
<b>MOBILIZATION</b>	<b>15%</b>			<b>\$6,435</b>	
<b>CONSTRUCTION TOTAL</b>				<b>\$49,335</b>	
<b>SALES TAX ON MATERIALS</b>	<b>5.0%</b>			<b>\$0</b>	
<b>ENGINEERING AND SUPPORT</b>	<b>20%</b>			<b>\$9,867</b>	
<b>CONST MANAGEMENT</b>	<b>8%</b>			<b>\$3,947</b>	
<b>CAPITAL TOTAL (ROUNDED)</b>				<b>\$60,000</b>	
<b>ANNUAL O&amp;M COST</b>			<b>\$24,300</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>				<b>\$302,000</b>	
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>				<b>\$362,000</b>	

## NOTES:

Misc Allowance markup is to include items known to exist but cannot be quantified at this time.  
 Contingency is for scope changes that are presently unforeseen.  
 Mobilization includes bonds, insurance, temporary facilities, health & safety, demobilization, etc.





## O &amp; M COST ESTIMATE DETAILS

Tasks	Qty	Unit	Material Unit Cost	Labor Unit Cost	Equip Unit Cost	Total Cost	Comments
<b><u>Annual Costs</u></b>							
Inspection	1	YR	0	400	80	\$480	asm 1 times/year & 8hrs/time @ \$50/hr labor & \$10 for pickup
Road Maintenance & Repairs	1	YR	0	0	0	\$0	
Pipeline & Structure Maint. & Repairs	1	YR	0	11,700	9,900	\$21,600	asm 3 times/year & 8hrs/time + material allowance
						\$22,080	
<b>Contingency</b>	10%					\$2,208	
<b>Total Annual Cost</b>						<b>\$24,288</b>	

Bunker Hill

DATE: 06/13/2000

AMD Mitigation Concepts

PROJECT NO.: 152215.FS.02

4.3: Improve Existing Diversions (Improve Seal, Decrease Weir Overflow)

Order of Magnitude Cost Opinion

ESTIMATE BY: D. Hedglin

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST	COMMENTS
<b>Modifications to Existing Diversion Structure</b>					
Diversion/Care of Water	1	LS	20,000.00	\$20,000	
Excavate for New Structure	150	CY	17.23	\$2,585	
Native Backfill Around Structure	60	CY	13.30	\$798	
Raise Existing Spillway on Dam	1	LS	23,299.89	\$23,300	allowance
Excavate for Screen Structure	70	CY	17.23	\$1,206	
Native Backfill Around Screen Structure	20	CY	13.30	\$266	
Backfill Riprap Overflow Spillway	325	CY	39.95	\$12,984	
Construct Screen Intake Structure	45	CY	552.24	\$24,851	
Construct Transition Structure	30	CY	552.24	\$16,567	
Bar Screen	1	LS	22,659.98	\$22,660	
Foundation Grout Curtain	1,500	LF	40.00	\$60,000	
Excavation	833	CY	17.23	\$14,358	
Gravel pad for concrete pad	50	CY	20.00	\$1,000	
Concrete base pad, 8+ thick	70	CY	300.00	\$21,000	
Riprap Cover	625	CY	28.62	\$17,884	
<b>SUBTOTAL</b>				<b>\$239,459</b>	
<b>MISC ALLOWANCE</b>	<b>10%</b>			<b>\$23,946</b>	
<b>SUBTOTAL</b>				<b>\$263,405</b>	
<b>CONTINGENCY</b>	<b>50%</b>			<b>\$131,703</b>	
<b>SUBTOTAL</b>				<b>\$395,108</b>	
<b>MOBILIZATION</b>	<b>15%</b>			<b>\$59,266</b>	
<b>CONSTRUCTION TOTAL</b>				<b>\$454,374</b>	
<b>SALES TAX ON MATERIALS</b>	<b>5.0%</b>			<b>\$5,113</b>	
<b>ENGINEERING AND SUPPORT</b>	<b>20%</b>			<b>\$90,875</b>	
<b>CONST MANAGEMENT</b>	<b>8%</b>			<b>\$36,350</b>	
<b>CAPITAL TOTAL (ROUNDED)</b>				<b>\$590,000</b>	
<b>ANNUAL O&amp;M COST</b>			<b>\$99,300</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>				<b>\$1,232,000</b>	
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>				<b>\$1,822,000</b>	

**NOTES:**

Misc Allowance markup is to include items known to exist but cannot be quantified at this time.

Contingency is for scope changes that are presently unforeseen.

Mobilization includes bonds, insurance, temporary facilities, health &amp; safety, demobilization, etc.



## O &amp; M COST ESTIMATE DETAILS

Tasks	Qty	Unit	Material Unit Cost	Labor Unit Cost	Equip Unit Cost	Total Cost	Comments
<b><u>Annual Costs</u></b>							
Inspection	1	YR	0	1,600	320	\$1,920	asm 4 times/year & 8hrs/time @ \$50/hr labor & \$10 for pickup
Road Maintenance & Repairs	1	YR	0	1,492	672	\$2,164	asm 1 time/year & 8hrs/time + material allowance
Pipeline & Structure Maint. & Repairs	1	YR	0	46,550	39,600	\$86,150	asm 12 times/year & 8hrs/time + material allowance
						\$90,235	
<b>Contingency</b>	10%					\$9,023	
<b>Total Annual Cost</b>						<b>\$99,258</b>	



## Bunker Hill

## AMD Mitigation Concepts

## 4.4: Improve Existing Diversion (Increase Pipeline Capacity)

## Order of Magnitude Cost Opinion

DATE: 06/13/2000

PROJECT NO.: 152215.FS.02

ESTIMATE BY: D. Hedglin

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST	COMMENTS
<b>New Pipeline</b>					
Clear & Grub New Road	1,330	LF	8.62	\$11,458	asm 30'w & 50'/hour
Grade, Fill & Compact New Road	1,330	LF	38.16	\$50,756	
Base Course on New Road	493	CY	24.92	\$12,277	
Erosion & Sedimentation Control	1	LS	41,643.58	\$41,644	\$/LF allowance for ditches, culverts, silt fences, sed ponds, etc
54" Pipeline in New Road	1,400	LF	218.69	\$306,159	including earthwork & fittings
Remove & Dispose of 36" CMP Pipe	1,400	LF	8.59	\$12,020	earthwork included above, remove, haul to disposal site, dispose
Thrust Block	1	EA	3,789.51	\$3,790	
Air Vent	1	EA	1,286.19	\$1,286	
Cut-off Trench Seepage Walls	14	EA	3,200.00	\$44,800	
<b>Modifications to Existing Diversion Structure</b>					
Diversion/Care of Water	1	LS	20,000.00	\$20,000	
Excavate for New Structure	150	CY	17.23	\$2,585	
Native Backfill Around Structure	60	CY	13.30	\$798	
Raise Existing Spillway on Dam	1	LS	23,299.89	\$23,300	
Excavate for Screen Structure	70	CY	17.23	\$1,206	
Native Backfill Around Screen Structure	20	CY	13.30	\$266	
Backfill Riprap Overflow Spillway	325	CY	39.95	\$12,984	
Construct Screen Intake Structure	45	CY	552.24	\$24,851	
Construct Transition Structure	30	CY	552.24	\$16,567	
Bar Screen	1	LS	22,659.98	\$22,660	
Foundation Grout Curtain	1,500	LF	40.00	\$60,000	
Excavation	833	CY	17.23	\$14,358	
Gravel pad for concrete pad	50	CY	20.00	\$1,000	
Concrete base pad, 8+ thick	70	CY	300.00	\$21,000	
Sheetpile Wall for Cutoff	2,250	SQ	30.00	\$67,500	
Native Backfill around Sheetpiles	1,800	CY	13.30	\$23,940	
Riprap Cover	625	CY	28.62	\$17,884	
<b>Collector Pipe &amp; Gabions</b>					
Excavation	675	CY	17.23	\$11,630	
Imported Bed, Zone & Backfill	563	CY	31.62	\$17,789	
Waste	675	CY	3.29	\$2,220	
36" Perf. Collector Pipe	450	LF	68.62	\$30,878	
Regrade Stream	1	LS	30,152.64	\$30,153	
Gabion Sediment Traps	150	CY	183.25	\$27,487	
<b>Bureau of Reclamation Stilling Basin</b>					
Structure Complete	1	LS	151,690.24	\$151,690	
<b>SUBTOTAL</b>				<b>\$1,086,936</b>	
<b>MISC ALLOWANCE</b>				<b>10%</b>	<b>\$108,694</b>
<b>SUBTOTAL</b>					<b>\$1,195,630</b>
<b>CONTINGENCY</b>				<b>50%</b>	<b>\$597,815</b>
<b>SUBTOTAL</b>					<b>\$1,793,445</b>
<b>MOBILIZATION</b>				<b>15%</b>	<b>\$269,017</b>
<b>CONSTRUCTION TOTAL</b>					<b>\$2,062,461</b>
<b>SALES TAX ON MATERIALS</b>				<b>5.0%</b>	<b>\$26,794</b>
<b>ENGINEERING AND SUPPORT</b>				<b>20%</b>	<b>\$412,492</b>
<b>CONST MANAGEMENT</b>				<b>8%</b>	<b>\$164,997</b>
<b>CAPITAL TOTAL (ROUNDED)</b>					<b>\$2,670,000</b>
<b>ANNUAL O&amp;M COST</b>			<b>\$99,300</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>					<b>\$1,232,000</b>
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>					<b>\$3,902,000</b>

## NOTES:

Misc Allowance markup is to include items known to exist but cannot be quantified at this time.

Contingency is for scope changes that are presently unforeseen.

Mobilization includes bonds, insurance, temporary facilities, health &amp; safety, demobilization, etc.



Exist Pipe O&M

O & M COST ESTIMATE DETAILS

Tasks	Qty	Unit	Material Unit Cost	Labor Unit Cost	Equip Unit Cost	Total Cost	Comments
<b><u>Annual Costs</u></b>							
Inspection	1	YR	0	1,600	320	\$1,920	asm 4 times/year & 8hrs/time @ \$50/hr labor & \$10 for pickup
Road Maintenance & Repairs	1	YR	0	1,492	672	\$2,164	asm 1 time/year & 8hrs/time + material allowance
Pipeline & Structure Maint. & Repairs	1	YR	0	46,550	39,600	\$86,150	asm 12 times/year & 8hrs/time + material allowance
						\$90,235	
<b>Contingency</b>	10%					\$9,023	
<b>Total Annual Cost</b>						<b>\$99,258</b>	



Bunker Hill  
AMD Mitigation Concepts  
5.1: Plug/Bypass Inez Shaft

DATE: 06/13/2000  
PROJECT NO.: 152215.FS.02  
ESTIMATE BY: D. Hedglin

## Order of Magnitude Cost Opinion

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST	COMMENTS
<b>Plug Shaft</b>					
Survey to Determine Location of Shaft	1	LS	3,200.00	\$3,200	
Provide 2000' of 15' wide access road	2,000	LF	25.00	\$50,000	
Excavate to Find Location	1	LS	51,690.24	\$51,690	15 days
Sheetpiles	2,700	SF	21.65	\$58,455	
Excavate to Top of Rock	555	CY	34.46	\$19,125	
Backfill Excavation	555	CY	13.30	\$7,381	
Prepare for Plug	1	LS	5,319.96	\$5,320	
Excavate & Waste 16' of Shaft	30	CY	258.45	\$7,754	largely handwork
Concrete Plug	30	CY	143.08	\$4,292	
Hydroseed all disturbed areas	60,000	SF	0.10	\$6,000	
Regrade Stream	1	LS	51,690.24	\$51,690	
<b>SUBTOTAL</b>				<b>\$264,908</b>	
<b>MISC ALLOWANCE</b>	<b>10%</b>			<b>\$26,491</b>	
<b>SUBTOTAL</b>				<b>\$291,399</b>	
<b>CONTINGENCY</b>	<b>50%</b>			<b>\$145,699</b>	
<b>SUBTOTAL</b>				<b>\$437,098</b>	
<b>MOBILIZATION</b>	<b>15%</b>			<b>\$65,565</b>	
<b>CONSTRUCTION TOTAL</b>				<b>\$502,663</b>	
<b>SALES TAX ON MATERIALS</b>	<b>5.0%</b>			<b>\$2,175</b>	
<b>ENGINEERING AND SUPPORT</b>	<b>20%</b>			<b>\$100,533</b>	
<b>CONST MANAGEMENT</b>	<b>8%</b>			<b>\$40,213</b>	
<b>CAPITAL TOTAL (ROUNDED)</b>				<b>\$650,000</b>	
<b>ANNUAL O&amp;M COST</b>			<b>\$500</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>				<b>\$6,000</b>	
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>				<b>\$656,000</b>	

## NOTES:

Misc Allowance markup is to include items known to exist but cannot be quantified at this time.  
Contingency is for scope changes that are presently unforeseen.  
Mobilization includes bonds, insurance, temporary facilities, health & safety, demobilization, etc.



## O &amp; M COST ESTIMATE DETAILS

Tasks	Qty	Unit	Material Unit Cost	Labor Unit Cost	Equip Unit Cost	Total Cost	Comments
<b><u>Annual Costs</u></b>							
Inspection	1	YR	0	400	80	\$480	asm 1 times/year & 8hrs/time @ \$50/hr labor & \$10 for pickup
Road Maintenance & Repairs	1	YR	0	0	0	\$0	
Pipeline & Structure Maint. & Repairs	1	YR	0	0	0	\$0	asm 2 times/year & 8hrs/time + material allowance
						\$480	
<b>Contingency</b>	10%					\$48	
<b>Total Annual Cost</b>						<b>\$528</b>	



Plug Holes

Bunker Hill  
AMD Mitigation Concepts  
6.1: Plug Drill Holes  
Order of Magnitude Cost Opinion

DATE: 06/13/2000  
PROJECT NO.: 152215.FS.02  
ESTIMATE BY: D. Hedglin

DESCRIPTION	QTY	UNIT	TOTAL UNIT COST	TOTAL COST	COMMENTS
<b>Plug Holes</b>					
Tunnel Clearing	1	LS	10,822.00	\$10,822	2 week w/4 man crew & equipment
Add anchor flange for high pressure hole	1	LS	10,000.00	\$10,000	
Plug Low Pressure Hole	20	EA	1,392.64	\$27,853	1 day w/ 3 man crew
Plug High Pressure Hole	1	EA	22,926.40	\$22,926	
<b>SUBTOTAL</b>				<b>\$71,601</b>	
<b>MISC ALLOWANCE</b>	<b>10%</b>			<b>\$7,160</b>	
<b>SUBTOTAL</b>				<b>\$78,761</b>	
<b>CONTINGENCY</b>	<b>30%</b>			<b>\$23,628</b>	
<b>SUBTOTAL</b>				<b>\$102,390</b>	
<b>MOBILIZATION</b>	<b>15%</b>			<b>\$15,358</b>	
<b>CONSTRUCTION TOTAL</b>				<b>\$117,748</b>	
<b>SALES TAX ON MATERIALS</b>	<b>5.0%</b>			<b>\$600</b>	
<b>ENGINEERING AND SUPPORT</b>	<b>20%</b>			<b>\$23,550</b>	
<b>CONST MANAGEMENT</b>	<b>8%</b>			<b>\$9,420</b>	
<b>CAPITAL TOTAL (ROUNDED)</b>				<b>\$150,000</b>	
<b>ANNUAL O&amp;M COST</b>			<b>\$9,200</b>		
<b>NPV OF ANNUAL O&amp;M COSTS (30 YEARS @ 7% INTEREST)</b>				<b>\$114,000</b>	
<b>TOTAL 30-YEAR PRESENT WORTH COST @ 7% INTEREST</b>				<b>\$264,000</b>	

NOTES:

Misc Allowance markup is to include items known to exist but cannot be quantified at this time.  
Contingency is for scope changes that are presently unforeseen.  
Mobilization includes bonds, insurance, temporary facilities, health & safety, demobilization, etc.





# Holes O&M

## O & M COST ESTIMATE DETAILS

Tasks	Qty		Unit Cost	Total Cost	Comments
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### Annual Costs

Packer Inspection and Maintenance	21	Each	400	\$8,400	\$400/hole @ 21 holes
				\$8,400	
<b>Contingency</b>	10%			\$840	
<b>Total Annual Cost</b>				<b>\$9,240</b>	

